Fundamental Issues

1. No safe dose of radiation
2. Nature of the Nuclear industrial complex
3. Reality of radiation releases
The Nuclear Industrial Complex (NIC)

The Three Poisonous P’s of Nuclear Industrial Complex

- Price
- Pollution
- Proliferation

Hallmarks of Nuclear Industrial Complex

- Secrecy
- Coverup
- Minimization
No harm to human health

There is no safe dose of radiation

The 4 R’s

• It is a great privilege to be alive at a time in the world’s history when a discovery akin to finding fire or electricity comes along...

• There used to be 3 R’s that everyone had to learn: Reading, ‘riting, and ‘rithmetic, to this we must now add a fourth R: Radiation
  • David Lilienthal 1st Chairman AEC 1949

Biologic Effects of Ionizing Radiation (BEIR VII)
National Academy of Science

• Low doses of radiation
  – Direct linear relationship between dose and development of solid tumors
    – BEIR VII June 2005
  There is no “safe” dose of radiation
Cancer and the Effects of Radiation

- A single exposure is sufficient to increase cancer incidence years later
- Radiation induced cancer is indistinguishable from naturally induced cancer
- Most cancers are increased in incidence after irradiation

» Boise, A.D.
» ACS conference, 1980
The Lucky Dragon
Dr. Alice Stewart

- Effects of xRay on unborn fetus
  - 1 pelvic xray increases the chance of child developing leukemia by 1.5
  - Pelvimetry was common 25 years ago

Radiation Risks

- One individual in 1000 will develop cancer from 10 mSv exposure (a whole body CT scan)
  - Chest xray =0.1 mSv =10mRem
Isotope half lives

- Iodine 131 8 days  Thyroid
- Strontium 90 29 yrs  Bone, teeth
- Cesium 137 30 yrs  Soft tissue, muscle
- Plutonium 239 24,000 yrs  Lung, kidney blood, spleen
**Natural Disasters**
- Begin
- Middle
- End

**Radiation**
- Contaminates, befouls, penetrates, pollutes
- Silent and unseen
- Frightens in new and special ways
- Dread lingers on and on

**Radiation disasters**
- Nuclear explosions 1945-1998
- Kyshtym (Chelyabinsk) 1957
- Three Mile Island 1979
- Chernobyl 1986
- Fukushima 2011

**Kyshtym 1957**
- Explosion of storage tank (similar to Hanford)
- 217 Villages destroyed
- 10,000 People evacuated over 2 year
- CIA knew of incident—Kept secret
Kyshtym

- Radiation cloud moved 350 KM
- Contaminated 800 square KM
- Still off limits as the East-Ural Radioactive Trace (EURT)
Conflicting Data regarding Chernobyl

- WHO/IAEA  56 deaths from radiation  
- 4000 eventual deaths
- International Agency for Research on Cancer  
- 16,000 eventual deaths
- Belarus Academy of Science  
- 93,000 deaths, 270,000 Cancers

Conflicting data regarding Chernobyl

- Russian Academy Science
  - 60,000 deaths in Russia
  - 140,000 deaths in Ukraine and Belarus
- Belarus Academy of Science  
- 93,000 deaths, 270,000 Cancers
- Ukrainian National commission
  - 500,000 deaths so far

Chernobyl ecosystem

- Reduced adult population by 43%
  - Reduced males by 24%
  - Reduced females by 57%
- Excess annual mortality of 1.8 million birds

Chernobyl barn swallows

- Elevated Mortality among Birds in Chernobyl as Judged from Skewed Age and Sex Ratios
  - Moller, Alquist, Rudolfsen, Mousseau, 2012
Nuclear Power Plants in the US

• 104 operating nuclear power plants and 36 non-power reactors in the US
• 11 operating plants in Northern Illinois
• Produce 8% of the nation’s energy

Spent Fuel Storage

• After 12-24 months in the reactor, fuel is offloaded into cooling ponds
• Must remain until cool
• More than 10x the radioactive material than the core (20-50 million curies Cs-137-Chernobyl released 2 million curies)

The single greatest danger...

[Image 1: Map showing nuclear power plants in the US]
[Image 2: Image of spent fuel storage]
[Image 3: Image related to nuclear threat]
[Image 4: Graphic showing nuclear warheads by country]
Limited nuclear war today

Smoke surrounding the globe
Freezing temperatures daily in the Northern Hemisphere
Over 1 billion would starve to death

Nuclear Weapons Today

• **20,000 nuclear warheads** with the equivalent explosive force of:
  – Over 200,000 Hiroshima-sized bombs.
  – 10 billion tons of TNT, 2 tons for every human on the planet.

• **Thousands on hair-trigger alert**, ready to be launched on a few minutes notice.
Nuclear “Football”

Hallmarks of Nuclear Industrial Complex

• Secrecy
• Coverup
• Minimization

Don’t lose sight of the forest for the Trees

• Blanketing the earth with unmeasured amounts of radiation which will affect the environment for thousands of years
  – Bombing
  – Leakage
  – Accidents
  – Waste
A dangerous experiment

- Layers of long lived radiation
- Unconsenting and Unknowing population exposed and not followed
- Results unknown for centuries

What can you do?
Read and educate yourself
Join PSR  WWW.PSR.ORG
WWW.IPPNW.ORG

The splitting of the atom has changed everything save our modes of thinking, and thus we drift toward unparalleled catastrophe.

DR. ALBERT EINSTEIN